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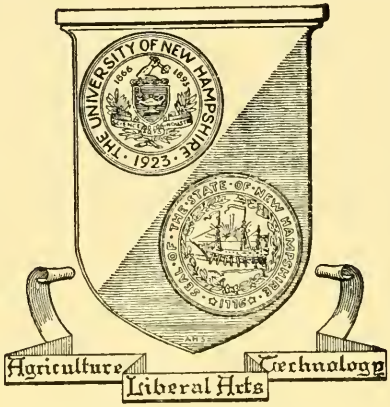

The University
of
New Hampshire

BULLETIN 375 SEPTEMBER, 1948

THE UNIVERSITY OF NEW HAMPSHIRE

AGRICULTURAL EXPERIMENT STATION

Department of Agricultural and Biological Chemistry

Inspection of Commercial Fertilizers

Made for the

STATE DEPARTMENT OF AGRICULTURE

T. O. SMITH and H. A. DAVIS

THE UNIVERSITY OF NEW HAMPSHIRE

DURHAM, N. H.

INSPECTION OF COMMERCIAL FERTILIZERS

Made for the

State Department of Agriculture

The inspection of commercial fertilizers reported in this bulletin was made under the direction of the Honorable Perley I. Fitts, Commissioner of Agriculture. Mr. George H. Laramie, Fertilizer Control Supervisor, and Mr. Vincent P. Peterson, Inspector, collected samples of 82 brands of mixed fertilizer and fertilizer materials which were offered for sale by dealers or had been delivered to consumers during the year ending June, 1948. The general character of the brands sampled is shown by the following classification:

Complete fertilizer	53
Phosphoric acid and potash	6
Superphosphate	7
Nitrate of soda	1
Muriate of potash	2
Ground bone	6
Milorganite	1
Natural manures	6

THE FERTILIZER LAW

The purchaser of fertilizer should familiarize himself with the full text of the fertilizer law. He should not accept from the dealer any bag of fertilizer which is not tagged and guaranteed in compliance with the law. The law governing these matters follows:

"Every lot or parcel of commercial fertilizer or fertilizer material sold or offered or exposed for sale within this state shall be accompanied by a plainly printed statement, clearly and truly certifying the number of net pounds of fertilizer in the package; the name, brand or trademark under which the fertilizer is sold; the name and address of the manufacturer or importer; the location of the factory; and a chemical analysis stating the minimum percentage of nitrogen, of available phosphoric acid and of water-soluble potash expressed in whole numbers.

"No fertilizer or fertilizer material containing the three essential fertilizing elements, nitrogen, phosphoric acid and potash may be sold or offered for sale if the total minimum plant food nutrients contained therein is less than fourteen per cent by weight, provided however that natural animal and bird manures shall be excepted from the provisions of this section."

Copies of the full text of the law may be obtained from the Fertilizer Control Supervisor, State House, Concord, N. H. Inquiries concerning the law and all matters relative to the registration of brands should be addressed to his office.

The chief purpose of the official inspection required by the fertilizer law is to protect the consumer against the misbranded products which doubtless would soon appear on the market if the sale of fertilizer was not under state regulation. The value of a fertilizer depends mainly upon its content of available plant food, particularly nitrogen, phosphoric acid, and potash. The presence of these constituents can be determined only by a chemical analysis. To insure that they are being furnished by manufacturers in the guaranteed amounts, it is considered

necessary that each brand of fertilizer offered for sale be officially inspected and analyzed each year. When failure to meet the guarantee is proved by chemical analysis, the prosecution or seizure provisions of the law may be invoked. The purchaser's refusal to buy a fertilizer which does not conform to the law will not only assist in the enforcement of the law but will at the same time insure himself the protection of the law. If the buyer fails to assure himself that the legal requirements have been met, he accepts the fertilizer at his own risk.

USE OF COMMERCIAL FERTILIZERS

It is not within the scope of this bulletin to make recommendations regarding the use of commercial fertilizers. The Department of Agronomy and the Department of Agricultural and Biological Chemistry of the University of New Hampshire Agricultural Experiment Station test soils and conduct experimental work with various fertilizer materials on hay and crop land. The Department of Horticulture investigates fertilizer treatments for fruits and vegetables. Much of this work has been published, and is available for free distribution to residents of New Hampshire. Address your request to Mail Service, University of New Hampshire, Durham, New Hampshire.

Sta. Cir.	47	Fertilizer Experiments with Sweet Clover. 12 pp.
Sta. Cir.	50	Fertilizer Experiments with Hay Lands in the Connecticut Valley. 15 pp.
Sta. Cir.	58	Fertilizer Needs of Alfalfa on New Hampshire Soils. 12 pp.
Sta. Cir.	59	Effect of Soil Moisture and Fertilizer Placement on Vitality of the Potato Seed Piece. 11 pp.
Sta. Cir.	61	Fertility Needs of Dairy Farm Crops in the Connecticut Valley. 12 pp.
Sta. Cir.	63	Fertilizers for Sweet Corn. 8 pp.
Sta. Cir.	74	The Response of Clover and Total Forage to Top-Dressing Fertilizers.
Sta. Bull.	306	Experiments with Grass Hay. 24 pp.
Sta. Bull.	320	Pasture Top-Dressing in New Hampshire. 24 pp.
Sta. Bull.	324	Experiment with Potatoes. 38 pp.
Sta. Bull.	362	Purchasing Fertilizers in New Hampshire. 31 pp.
Ext. Cir.	65	Worn-Out Hay Lands. 4 pp.
Ext. Cir.	99	Asparagus Culture. 4 pp.
Ext. Cir.	173	Grape Growing in New Hampshire. 11 pp.
Ext. Cir.	210	Purchasing Lime and Fertilizer. 12 pp.
Ext. Cir.	212	Cabbage. 4 pp.
Ext. Cir.	260	Tomatoes for Good Health. 8 pp.
Ext. Cir.	266	Root Crops. 20 pp.
Ext. Cir.	273	The Home Vegetable Garden. 20 pp.
Ext. Cir.	275	Culture of Low-Bush Blueberries.
Ext. Cir.	279	Strawberry Culture. 4 pp.
Ext. Cir.	289	Cane Fruit Culture. 8 pp.
Ext. Bull.	45	Potato Growing in New Hampshire. 32 pp.
Ext. Bull.	65	Home Fruit Growing in New Hampshire. 16 pp.

While the word fertilizer does not appear in all the above titles, no publication is included which does not discuss the use of fertilizer.

CONFORMITY TO GUARANTEE

The chemical analyses were made by the methods of the Association of Official Agricultural Chemists. Forty-six of the 82 brands analyzed equaled or exceeded the manufacturers' guarantees. Two brands failed to meet the guarantee in all of the three constituents, total nitrogen, available phosphoric acid, and water-soluble potash. Eleven brands were below guarantee in two of the three constituents. Twenty-three brands failed to meet the guarantee in only one constituent. Three brands were guaranteed to contain magnesium oxide. None failed to meet the guarantee.

In the tabulation of the analyses in the following pages deficiencies of one-half per cent or more are shown in red bold-face type. The manufacturers are arranged alphabetically. The brand name is listed alphabetically, or numerically by formula, under the manufacturer.

	Nitrogen		Phosphoric Acid				Potash		Magnesium Oxide	
			Total		Available					
	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found
American Agricultural Chemical Co. North Weymouth, Massachusetts										
Agrico 0-14-14	....	....	....	....	14.00	13.72	14.00	14.01	....	....
Agrico Bone Meal	2.00	2.83	23.00	26.87	....	....	....	....	....	....
Agrico for Corn 3-12-6	3.00	2.96	....	....	12.00	11.28	6.00	6.40	....	....
Agrico for Gardens 5-10-5	5.00	4.85	....	....	10.00	10.20	5.00	5.24	....	....
Agrico for Lawns, Trees and Shrubs 6-10-4	6.00	6.05	....	....	10.00	10.02	4.00	4.01	....	....
Agrico for New England 5-8-7	5.00	4.93	....	....	8.00	7.80	7.00	7.28	....	....
Agrico for Potatoes 5-10-10	5.00	4.95	....	....	10.00	10.06	10.00	9.67	....	....
Agrico for Top Dressing 7-7-7	7.00	6.92	....	....	7.00	7.04	7.00	7.21	....	....
Agricultural Country Club Fertilizer 8-6-2	8.00	8.02	....	....	6.00	6.34	2.00	2.35	....	....
18% Normal Superphosphate	....	....	....	....	18.00	18.05	....	....	....	....
Pulverized Sheep Manure	1.25	1.75	1.00	1.48	....	....	2.00	3.53	....	....
Apothecaries Hall Co. Waterbury, Connecticut										
Liberty Brand 4-12-4	4.00	4.27	....	....	12.00	12.37	4.00	4.26	....	....
Liberty Brand 5-10-10	5.00	5.24	....	....	10.00	10.42	10.00	10.55	....	....
Liberty Brand 7-7-7	7.00	7.01	....	....	7.00	7.96	7.00	7.27	....	....
Liberty Brand Bone Meal	2.25	2.82	22.00	26.87	....	....	....	....	....	....
Liberty Brand High Grade Market Gardener 5-8-7	5.00	5.26	....	....	8.00	8.48	7.00	7.31	....	....
Liberty Brand Superphosphate	....	....	....	....	20.00	20.48	....	....	....	....
Armour Fertilizer Works Carteret, New Jersey										
Armour's 4-12-8	4.00	4.03	....	....	12.00	11.68	8.00	8.02	....	....

	Nitrogen		Phosphoric Acid				Potash		Magnesium Oxide	
			Total		Available					
	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found
Armour's 8-16-16	8.00	7.95	....	....	16.00	15.21	16.00	15.01	....	....
Armour's Big Crop Fertilizer 0-14-7	....	....	....	....	14.00	14.53	7.00	7.72	....	....
Armour's Big Crop Fertilizer 0-14-14	....	....	....	....	14.00	14.01	14.00	14.63	....	....
Armour's Big Crop Fertilizer 5-8-7	5.00	5.02	....	....	8.00	7.66	7.00	7.05	....	....
Armour's Big Crop Fertilizer 5-10-10	5.00	5.02	....	....	10.00	10.08	10.00	10.01	....	....
Armour's Big Crop Fertilizer 7-7-7	7.00	6.81	....	....	7.00	8.22	7.00	7.44	....	....
Armour's Big Crop Superphosphate 20%	....	....	....	....	20.00	20.59	....	....	....	....
Armour's Bone Meal	2.47	2.14	23.00	26.95	....	....	....	....	....	....
Armour's Pulvérized Sheep Manure	1.50	1.84	1.00	1.43	....	....	1.50	1.92	....	....
Armour's 5-10-5 Velvetgreen Plant Food	5.00	5.09	....	....	10.00	10.08	5.00	5.44	....	....
Atkins and Durbrow, Inc. New York, New York										
O. K. Manure	2.00	1.19	1.00	0.87	....	....	1.00	0.81	....	....
Berkshire Chemical Co. Bridgeport, Connecticut										
Berkshire Fertilizer 5-8-7	5.00	5.04	....	....	8.00	8.06	7.00	7.33	....	....
Berkshire Fertilizer 7-7-7	7.00	7.01	....	....	7.00	7.07	7.00	7.28	....	....
Chilean Nitrate Sales Corp. New York, New York										
Champion Brand Chilean Nitrate of Soda	16.00	16.18	....	....	....	....	....	....	....	....
Consolidated Rendering Co. Boston, Massachusetts										
Corenco 0-14-14	....	....	....	....	14.00	13.02	14.00	14.54	....	....

	Nitrogen		Phosphoric Acid				Potash		Magnesium Oxide	
			Total		Available					
	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found
Corenco 4-12-16	4.00	4.01	....	....	12.00	11.55	16.00	16.20	....	....
Corenco 5-8-7	5.00	5.38	....	....	8.00	8.32	7.00	7.48	....	....
Corenco 5-10-10	5.00	4.83	....	....	10.00	10.03	10.00	10.21	....	....
Corenco 8-6-4	8.00	8.15	....	....	6.00	6.08	4.00	4.08	....	....
Corenco Brand Golden Jubilee Sheep Manure	1.25	1.62	1.00	1.47	....	....	2.00	3.36	....	....
Corenco 7-7-7 Complete Fruit and Top Dressing	7.00	7.03	....	....	7.00	7.42	7.00	7.22	....	....
Corenco Ground Bone	2.00	1.94	23.00	26.05	....	....	....	....	....	....
Corenco Superphosphate 20%	....	....	....	....	20.00	20.30	....	....	....	....
Davison Chemical Corp. Baltimore, Maryland										
Davco 0-14-14	....	....	....	....	14.00	13.42	14.00	14.01	....	....
Davco 7-7-7	7.00	6.76	....	....	7.00	8.38	7.00	5.96	....	....
Davco Granulated Fertilizer 5-8-7	5.00	5.50	....	....	8.00	8.28	7.00	7.42	....	....
Davco Granulated Fertilizer 5-10-5	5.00	5.59	....	....	10.00	10.54	5.00	5.13	....	....
Davco Granulated Superphosphate 20%	....	....	....	....	20.00	20.63	....	....	....	....
Eastern States Farmers' Exchange, Inc. West Springfield, Mass.										
Eastern States 5-10-5	5.00	5.26	....	....	10.00	10.04	5.00	5.56	....	....
Eastern States 5-10-10	5.00	5.09	....	....	10.00	10.52	10.00	10.54	....	....
Eastern States 5-15-10	5.00	5.18	....	....	15.00	15.66	10.00	10.06	....	....
Eastern States 5-15-15	5.00	5.19	....	....	15.00	14.16	15.00	15.64	....	....
Eastern States 8-16-16	8.00	8.04	....	....	16.00	16.11	16.00	16.05	....	....
Eastern States 10-10-10	10.00	9.78	....	....	10.00	12.95	10.00	9.10	....	....
Eastern States Superphosphate 20%	....	....	....	....	20.00	20.77	....	....	....	....

	Nitrogen		Phosphoric Acid				Potash		Magnesium Oxide	
			Total		Available					
	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found
International Minerals & Chemical Corp. Woburn, Massachusetts										
International 0-14-14	....	....	....	....	14.00	14.10	14.00	13.11	....	....
International 4-12-4	4.00	4.25	....	....	12.00	11.34	4.00	3.86	....	....
International 4-12-8	4.00	4.26	....	....	12.00	11.54	8.00	7.17	....	....
International 5-8-7	5.00	4.99	....	....	8.00	8.12	7.00	7.41	....	....
International 5-10-10	5.00	5.01	....	....	10.00	8.93	10.00	10.18	....	....
International 6-12-12-2	6.00	6.06	....	....	12.00	12.06	12.00	11.46	2.00	2.57
International 7-7-7	7.00	6.94	....	....	7.00	7.76	7.00	7.02	....	....
International 8-6-2	8.00	7.75	....	....	6.00	6.02	2.00	2.17	....	....
International 8-16-16 1 1/2	8.00	7.93	....	....	16.00	16.22	16.00	16.17	1.50	2.46
International Bone Meal	3.70	3.45	20.00	19.02	....	....	....	....	....	....
International 60% Muriate of Potash	....	....	....	....	....	....	60.00	60.05	....	....
International Potato 5-10-10-2	5.00	5.04	....	....	10.00	10.03	10.00	10.02	2.00	4.13
Merrimack Farmers' Exchange, Inc. Concord, New Hampshire										
Merrimack Brand 4-12-4	4.00	4.01	....	....	12.00	12.04	4.00	1.34	....	....
Merrimack Brand 4-12-16	4.00	4.11	....	....	12.00	11.85	16.00	15.54	....	....
Merrimack Brand 5-8-7	5.00	5.02	....	....	8.00	8.74	7.00	7.29	....	....
Merrimack Brand 5-10-10	5.00	5.27	....	....	10.00	10.24	10.00	10.07	....	....
Merrimack Brand 7-7-7	7.00	7.40	....	....	7.00	7.68	7.00	7.33	....	....
Harold L. Norwood North Reading, Massachusetts										
Norwood Brand Sheep Manure	1.50	1.32	0.35	0.31	....	....	2.75	2.91	....	....

	Nitrogen		Phosphoric Acid				Potash		Magnesium Oxide	
			Total		Available					
	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found	Guaranteed	Found
Potash Company of America Carlsbad, New Mexico										
Muriate of Potash	....	....	....	....	....	....	60.00	60.38	....	....
Profile Fertilizer Co. Manchester, New Hampshire										
Sheep Fertilizer	1.30	1.23	0.16	0.23	....	....	2.22	2.41	....	....
Rogers & Hubbard Co. Portland, Connecticut										
Gro-Fast Bone Meal	2.00	2.21	23.00	26.35	....	....	....	....	....	....
Hubbard 20% Superphosphate	....	....	....	....	20.00	18.80	....	....	....	....
Red H 4-12-4	4.00	4.34	....	....	12.00	12.08	4.00	4.97	....	....
Red H 5-8-7	5.00	5.25	....	....	8.00	9.20	7.00	7.86	....	....
Red H 5-10-10	5.00	5.26	....	....	10.00	10.07	10.00	10.32	....	....
Red H 7-7-7	7.00	7.16	....	....	7.00	7.48	7.00	7.64	....	....
Red H 8-16-16	8.00	8.01	....	....	16.00	14.81	16.00	14.88	....	....
Sewerage Commission Milwaukee, Wisconsin										
Milorganite	6.00	6.03	2.00	2.79	....	....	....	....	....	....
Swift & Co. Cleveland, Ohio										
Vigoro (Neutral)	4.00	4.05	....	....	12.00	11.16	4.00	4.34	....	....